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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
PARK, JUNG H	

ART UNIT	PAPER NUMBER
2616	

DATE MAILED: 07/25/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/899,509	KODIALAM ET AL.	
	Examiner	Art Unit	
	Jung Park	2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 June 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6 and 17-20* is/are rejected.

7)☒ Claim(s) *7-16* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-3, 5-6 and 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chang et al. (US 6,160,651, "Chang") and in view of Okayama et al. (US 5,786,916, "Okayama").

Regarding claims 1 and 18, Chang discloses the method of claim 1 and the apparatus of claim 18. Chang discloses that the initial graph is generated for the packet network (*fig.4; col.10, ln.22-40*) integrating IP layer 410 and optical layer 420 as nodes 421-425 and links (*between the nodes*) of the graph (*claim - generating a graph for the packet network integrating logical and optical layers as nodes and links of the graph*). The existed graph (*fig.5*) is modified when the preferred path 502 is occupied by another packet 510 & 511 (*new demand*) and then paths 503 & 504 may represent the alternative path (*col.11, ln.8-24; claim - modifying the graph, if necessary, based on the new demand and any previously routed demands*) in order to determine a route through the new paths (*col.11, ln.8-24; claim - determining a router through the modified graph as the path for the new demand*).

Chang fails to disclose, "each node of the graph accounts for presence or absence of wavelength conversion with the node." However, Okayama teaches an optical-wavelength interchanger element (*in fig.4 and col.9, ln.34-41*) in that the first light

signal L1 is converted in wavelength converter 30 and on the other hand, the second light signal L2 is given to the joining section 50 without wavelength conversion.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of applicant's invention to include the optical-wavelength interchanger element taught by Okayama to the nodes of graphs disclosed by Chang since one would be motivated to include the element in order to perform wavelength selection (*Okayama, col.9, ln.20-23*).

Regarding claim 2, Chang further discloses that each node and link of the graph is present in the graph based on a residual capacity of each wavelength of each optical link (col.11, ln.8-18 where the cost of path utilizing wavelength is based on ...and the traffic load. That is, it is based on the residual capacity; see also col.7, ln.34-37).

Regarding claim 3, Chang further discloses that each node based on whether it is a router (IP router 411 fig.4), an optical cross-connect (OXC) with wavelength conversion, or an OXC without wavelength conversion (WDM nodes 421-425 fig.4; col.10, ln.57-58), and ii) each available wavelength of an optical link between nodes in the graph with a corresponding link in the graph (col.7, ln.34-37).

Regarding claim 5, Chang further discloses that claim 1 further comprising the step of routing packetized data along the path (fig.5).

Regarding claim 6, Chang further discloses that at least one of the nodes includes an optical interface, and at least one of the links is an optical link, and the

nodes and links are in a wavelength division multiplex (WDM) communications network (fig.2).

Regarding claims 17 and 19, Chang further discloses that the method is embodied in a processor of at least one of a route and a router of a packet network server (fig.4 where it is inherent that at least one processor is required to process routing algorithm(s) along the route path created by the routers).

Regarding claim 20, Chang-Okayama disclose, all the claim limitations as stated in claim 1, except for a computer readable device containing instructions.

However, it would have been obvious to one of ordinary skill in the art at the time of applicant's invention was made to use software-based machines. The benefit using computer-readable device is that program can be changed and upgraded and new features are added easily than hardware changes.

3. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chang and in view of Okayama and further in view of Khotimsky et al. (US 6,646,989, "Khotimsky").

Regarding claim 4, Chang-Okayama lack what Khotimsky discloses that the determining step includes the step of computing the path through the reduced graph via a shortest path routing algorithm (col.6, ln.43-44 where ...Dijkstra's shortest path algorithm).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of applicant's invention was made to apply Dijkstra's algorithm taught by Khotimsky to the packet network disclosed by Chang-Okayama since one would be motivated to

apply the algorithm to find the optimal path to the desired destinations in the entire network or sub-network (Khotimsky, col.6, ln.41-42). For example, OSPF (open shortest path first) is a well known real-world implementation of Dijkstra's algorithm used in Internet routing.

Allowable Subject Matter

4. Claims 7-16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

5. Applicant's arguments filed June 6, 2006 have been fully considered but they are not persuasive.

In page 2 (for claim 1), applicant argues that Chang does not teach the desirability of generating a graph to model the network. In reply, the network graph (fig.4) is *initially generated* for modeling of the packet network integrating IP layer 410 and optical layer 420 as described in col.10, ln.22-40.

In page 3 (for claim 1), applicant argues that Okayama does not teach the desirability of generating a graph to model network. In reply, Okayama teaches an optical-wavelength interchanger element (in fig.4 and col.9, ln.34-41) in that the first light signal L1 is converted in *wavelength converter* 30 and on the other hand, the second light signal L2 is given to the joining section 50 *without wavelength conversion*. The wavelength interchanger element disclosed by Okayama can be easily applied to the

optical network, which is initially generated in the network of Chang's disclosure, to perform wavelength selection.

In page 4 (for claim 2), applicant argues that Chang does not disclose modeling residual capacity as units of bandwidth available for future demands. In reply, Chang discloses that the cost for preferred path is based on the total propagation distance, the number of hops, and the traffic load. That is, the node and link of the graph are determined based on available capacity for future demands.

In page 4 (for claim 3), applicant argues that neither Chang, Okayama, nor Khotimsky discloses modeling nodes based on whether or not wavelength conversion exists at that node. This argument is already addressed in the response for claim 1.

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Contact Information

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jung Park whose telephone number is 571-272-8565. The examiner can normally be reached on Mon-Fri during 7:10-4:40.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chau Nguyen can be reached on 571-272-3126. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JP
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